

Clerodendrum and Petrea are not herein used. The words "man" and "is" are misspelled on pages xi and 97 respectively.

"CHROMOSOME BOTANY — and the Origins of Cultivated Plants", Third (Revised) Edition by C. D. Darlington, xvii & 237 pp., illus., Hafner Press, New York, N. Y. 10022. 1973. \$12.95.

The previous editions of 1956 and 1963, and even more so this one, effectively stress "that civilization has always been the work of men who grew grain crops and lived on them. Since we also know (partly by their chromosomes) what wild grains they first grew we also know where to find the origins and how to trace the movements of civilization." Then this well qualified author traces the genetic stories of our major agricultural and horticultural crops, but this follows a very careful treatment of the major chromosomal and intrachromosomal processes and aberrations and their effects upon dividing and fusing cells. "The breakage of a chromosome is often the first visible step in the breakage of a species."

The bibliography is arranged by chapter topics and has had pertinent new items added to it. Appendix I lists the earliest use in English of names for cultivated plants. Appendix II by E. B. Ford considers similar evolutionary processes in animals. There is a helpful modern table listing the "regions of origin of crop plants (after Vavilov, revised in the light of work by Baker, Barrau, Burkill, Collins, Helbaek, Hutchinson, Kuptsov, Rick, Salaman, Simmonds, Whitaker, Zohary and others)".

So many valuable facts and their interpretations are presented effectively in this small, yet very useful, book that no genetics course should bypass it.

 ADDITIONAL NOTES ON THE GENUS VERBENA. XIX

Harold N. Moldenke

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It is perhaps worth mentioning here that the Chodat & Hassler (1904) reference in the above bibliography is sometimes erroneously cited as "Plantae Hasslerianae IX, 477"; the Benke (1933) reference is sometimes cited as "Rhodora 10. 1943" or "34: 45"; and the Pase & Johnson (1968) reference has been cited previously inaccurately as "U. S. Dept. Agr. Forest Serv." In regard to the J. C. & M. Willis (1911) publication, M. Willis is mentioned as

co-author on the cover of the work but not on its title-page!

Alcock (1876) credits the name, Verbena, to Pliny and says "Speaking of 'Sagmen' and 'Verbena' Pliny says: 'These two names no doubt originally signified the same thing -- a green turf torn up from the citadel, with the earth attached to it, and hence, when envoys were despatched to the enemy for the purpose of clarification, or, in other words, with the object of clearly demanding restitution of property that had been carried off, one of these officers was always known as the 'verbenarius', -- or bearer of the verbenae. The etymology of the name is dubious. It has been said to be derived from Keltic ferfaen, having the same significance as Saxifraga.....The word verbenae (L.) signified generally sacred boughs, or branches of trees that were used in religious ceremonies; hence it has been suggested that it is a corruption of two G. words, hiera botane, or sacred plant."

Vansell (1931) reports the name "valley vervena" for species of Phacelia in California -- obviously a typographic error for "valley verbena". Gibert (1873) cites Gibert 445, 448, 451, 452, & 979 as unidentified species of Verbena, but, of course, his concept of Verbena included Aloysia, Phyla, and perhaps other genera now recognized as distinct. The J. P. Simon 477, distributed as Verbena sp., is actually Diostea scoparia (Gill. & Hook.) Miers.

It is worth noting that Raeschel (1797) divides the genus Verbena into two sections: (1) Diandrae (including what we now recognize as Bouchea, Stachytarpheta, and Phyla stoechadifolia) and (2) Tetrandrae (including Phyla nodiflora, Priva adhaerens, Aloysia, Lippia alba, and true Verbena spp.).

Fell (1955) reports of the verbenas of Winnebago County, Illinois: "Variations in individuals and extensive hybridization among our 5 native verbenas produce such a mingling of characters that picking out the parents is difficult and at times quite impossible. Dr. Moldenke has named some of these hybrids in his account of the genus in the New Illustrated Britton and Brown and he has revised some of our specimens. Hybrids are much more common in some pastures than in others where the opportunity of crossing seems as great. The prairies about Camp Grant and pastures in Kishwaukee River bottom near Perryville road bridge and on River Road south of Cherry Valley are especially prolific. The most common crosses are x rhydbergii and x moechina."

Additional excluded species:

Verbena undulata Reitz, Sellowia 13: 67. 1961; Reitz, Sellowia 22: 145. 1970 = Lantana undulata Schrank.

The L. F. Ward s.n. [Washington, May 18, 1886], distributed as a species of Verbena, is actually a species of Veronica in the Scrophulariaceae.

VERBENA ABRAMSI Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 53: 6374 (1972)

and 54: 1729. 1972; Moldenke, *Phytologia* 24: 216 (1972) and 25: 234. 1973; Anon., *Biol. Abstr.* 55 (10): B.A.S.I.C. S.270. 1973; Howitt & Howell, *Suppl. Vasc. Pl. Monterey Co.* 28. 1973.

Additional citations: CALIFORNIA: Riverside Co.: M. Hall s.n. [May 18, 1940] (Ba).

xVERBENA ADULTERINA Hausskn.

Additional bibliography: Moldenke, *Phytologia* 23: 213. 1972.

VERBENA ALATA Sweet

Additional & emended bibliography: Paxt., *Pock. Bot. Dict.*, ed. 1, 328 (1840) and ed. 2, 328. 1849; Reitz, *Sellowia* 22: 145. 1970; Angely, *Fl. Anal. & Fitogeogr. S. Paulo*, ed. 1, 4: 838 & xix. 1971; Anon., *Biol. Abstr.* 54 (7): B.A.S.I.C. S.280. 1972; Moldenke, *Phytologia* 23: 258 & 436. 1972.

According to Paxton (1840) this species was introduced into cultivation in England in 1828.

The Lindeman & Haas 3010, distributed as V. alata, is more probably V. montevidensis Spreng., even though it is referred to on the label as a "shrub 1.2 m. tall, almost leafless".

VERBENA ALATA f. ALBA Moldenke

Additional bibliography: Moldenke, *Phytologia* 23: 213. 1972.

VERBENA AMBROSIFOLIA Rydb.

Additional & emended bibliography: Rydb., *Fl. Prairies & Plains*, pr. 1, 677, 678, & 967. 1932; Fedde & Schust. in *Just, Bot. Jahresber.* 60 (2): 575. 1941; Waterfall, *Rhodora* 51: 27. 1949; Kearney, *List Citations Place Publ. Spp. Ariz. Fl.* 112 [typescr.]. 1951; W. A. Weber, *Handb. Pl. Colo. Front Range*, ed. 1, 156 (1953) and ed. 2, 156. 1961; W. A. Weber, *Rocky Mtn. Fl.*, ed. 1, 305. 1967; Solbrig in *Heywood, Mod. Meth. Pl. Tax.* 88 & 89. 1968; Rydb., *Fl. Prairies & Plains*, pr. 2, 2: 677, 678, & 967. 1971; Moldenke, *Biol. Abstr.* 54: 1194. 1972; Moldenke, *Phytologia* 24: 20, 54, 242, & 255. 1972; W. A. Weber, *Rocky Mtn. Fl.*, ed. 2, 305. 1972; Anon., *Biol. Abstr.* 55 (10): B.A.S.I.C. S.270. 1973; Stacey, *Ariz. Highw.* 49 (3): 7. 1973.

Illustrations: Stacey, *Ariz. Highw.* 49 (3): 7 [in color]. 1973.

Dress refers to this plant as having decumbent stems and found it growing "in low barren dry (but vernaly moist) ground". Reveal and his associates encountered it on steep mountain slopes, associated with Yucca, Opuntia, and other shrubs. Tharp reports it from "valleys and roadsides". The Spellenberg's describe the plant as forming "clumps with many stems". The corollas on Spellenberg & Spellenberg 3062 are said to have been "pink". The color illustration in the Stacey (1973) article referred to above does not show enough detail to make identification certain, but it seems likely that it depicts V. ambrosifolia.

An artificial cross between this species and V. canadensis (L.) Britton is described by Solbrig (1968) but has not been

named. The Denham 2001, distributed as V. ambrosifolia, is actually V. ambrosifolia f. eglandulosa Perry.

Additional citations: COLORADO: Archuleta Co.: Weber & Livingston 6258 (Bl--71228). Boulder Co.: W. A. Weber 3911 (Bl--16775). Huerfano Co.: M. Douglass 54-133 (Bl--134645). Las Animas Co.: W. A. Weber 3303 (Bl--19629). Pueblo Co.: M. Douglass 54-81 (Bl--134859). TEXAS: Loving Co.: Stuessy 184 (Ws). Pecos Co.: Tharp 43-796 (Bl--53320). Zavala Co.: Ramirez & Cardenas 13 (Bl--209430, Bl--209443). NEW MEXICO: Chavez Co.: W. A. Weber 14511 (Bl--257053). Guadalupe Co.: Dress 2883 (Ba). ARIZONA: Cochise Co.: Spellenberg & Spellenberg 3062 (N). MEXICO: Coahuila: Reveal, Hess, & Kiger 2574 (N, W--2632235); Rinehart 7004 (Ml).

VERBENA AMBROSIFOLIA f. EGLANDULOSA Perry

Additional bibliography: Fedde & Schust. in Just, Bot. Jahresber. 60 (2): 575. 1941; Waterfall, Rhodora 51: 27. 1949; Moldenke, Phytologia 23: 213. 1972.

Waterfall (1949) cites Waterfall 7437 from Cimarron County, Oklahoma, growing on a stony hillside. The Denham 2055, distributed as V. ambrosifolia f. eglandulosa, is actually V. gooddingii var. nepetifolia Tidestr.

Additional citations: NEW MEXICO: Luna Co.: Denham 2001 (Bl--244669).

VERBENA AMOENA Paxt.

Additional bibliography: Paxt., Pock. Bot. Dict., ed. 1, 328 (1840) and ed. 2, 328. 1849; Moldenke, Phytologia 23: 214. 1972.

Paxton (1840) avers that this species was introduced into cultivation in England in or before 1839.

VERBENA ARISTIGERA S. Moore

Additional bibliography: Moldenke, Phytologia 23: 182 & 419 (1972) and 24: 236, 238, & 239. 1972.

The corollas on Hatschbach 23884, Krapovickas, Cristóbal, Mroginski, & Fernandez 22730, V. Maruflak 126, and Schinini & Mroginski 4476 are said to have been "violet" when fresh. Recent collectors have found this plant in bloom in April, September, and November, growing in white sandy soil on "campo limpo algo úmido".

Additional citations: BRAZIL: Mato Grosso: Hatschbach 23884 (N). PARAGUAY: V. Maruflak 126 (Ws). ARGENTINA: Corrientes: Krapovickas, Cristóbal, Mroginski, & Fernandez 22730 (Ld); Schinini & Mroginski 4664 (Ld).

VERBENA ATACAMENSIS Reiche

Additional bibliography: Moldenke, Phytologia 23: 182. 1972.

Additional citations: CHILE: Atacama: Worth & Morrison 16154 (Ba).

VERBENA BALANSAE Briq.

Additional bibliography: Reitz, Sellowia 22: 145. 1970; Moldenke, Phytologia 23: 214--215 (1972) and 24: 232 & 242. 1972.

VERBENA BANGIANA Moldenke

Additional bibliography: R. C. Foster, Contrib. Gray Herb. 184: 170. 1958; Moldenke, Phytologia 23: 215. 1972.

VERBENA BARBATA Grah.

Additional bibliography: Paxt., Pock. Bot. Dict., ed. 1, 328 (1840) and ed. 2, 328. 1849; Moldenke, Phytologia 23: 215 (1972) and 25: 234. 1973.

Paxton (1840) states that this plant was introduced into cultivation in England in 1826.

VERBENA BERTERII (Meisn.) Schau.

Additional bibliography: Moldenke, Phytologia 23: 258, 284, & 377. 1972.

Morrison refers to this plant as "not common; bush 0.3 m. tall; flowers lilac" and found it in flower and fruit in December. My wife and I, however, found it extremely common in the Santiago area when we collected there in 1948.

Material of *V. berterii* has been misidentified and distributed in some herbaria under the name of *Glandularia laciniata* (L.) Schnack & Covas.

Additional citations: CHILE: Aconcagua: Zöllner 6483 (Ac), 6817 (Ld). Colchagua: Zöllner 6471 (Ac). Santiago: Mahu 758-L (Bl--208643), 4232 (Bl--248578); J. L. Morrison 16771 (Ba). Valparaiso: Zöllner 7024 (Ac).

VERBENA BIPINNATIFIDA Nutt.

Additional & emended bibliography: Rydb., Fl. Prairies & Plains, pr. 1, 677--679 & 967. 1932; Fedde & Schust. in Just, Bot. Jahresber. 60 (2): 575. 1941; Kearney, List Citations Place Publ. Spp. Ariz. Fl. 112 [typescr.]. 1951; Foley, Ground Covers, pr. 1, 134. 1961; Solbrig in Heywood, Mod. Meth. Pl. Tax. 88 & 89. 1968; Drar, Publ. Cairo Univ. Herb. 3: 111. 1970; Agarwal, Journ. Indian Bot. Soc. 50: 374--376. 1971; Foley, Ground Covers, pr. 2, 134. 1971; Rydb., Fl. Prairies & Plains, pr. 2, 677--679 & 967. 1971; Vyas, Agarwal, & Garg, Phyton Rev. Int. Bot. Exp. 28: 161--164. 1971; Anon., Biol. Abstr. 54: 2495 (1972) and 54 (5): B.A.S. I.C. S.272. 1972; Farnsworth, Pharmacog. Titles 7 (10): xvi. 1972; Fong & al., Lloydia 25: 117--149. 1972; Moldenke, Phytologia 23: 258--259, 302, 414, 426, & 435 (1972) and 24: 51, 53, 131, 238, & 239. 1972; G. W. Park, Parks Flow. Book 1973: 86. 1972; R. R. Stewart in Nasir & Ali, Fl. West Pakist. 608. 1972; Anon., Biol. Abstr. 55 (5): B.A.S.I.C. S.267. 1973; Kral, Rhodora 75: 400. 1973; "L. E.", Biol. Abstr. 55: 2879. 1973.

Agarwal (1971) treated seeds of what he says was this species (but I suspect strongly that they were *V. tenuisecta* Briq.!) with various combinations of thio- and ascorbic acid for 12 hours and

then let them germinate under continuous light or in continuous darkness. Ascorbic acid affected germination poorly when applied alone, but markedly increased the stimulation caused by thiourea. With increasing proportion of thiourea greater germination occurred in continuous light, while with increasing proportion of ascorbic acid germination was greater in continuous darkness. Vyas, Agarwal, & Garg (1971) studied germination and growth of the same species in different soil types and found that field capacity, as well as Ca and organic content of the soil, control the growth and distribution of this species [again, probably V. tenuisecta]. Drar (1970) records V. bipinnatifida as cultivated in the Sudan, but here again it is virtually certain that the plant he refers to is the commonly cultivated V. tenuisecta Briq.

Recent collectors have found V. bipinnatifida growing along roadsides, in dry stony rough ground, open neglected fields, and xeric pastures without crops. Lawrence refers to it as a "floppy perennial, 15 inches tall". Ruth refers to it as common throughout Tarrant County and the entire state of Texas. The flowers are sometimes referred to as fragrant. The corollas are described as having been "lavender" on Fryxell 1238 and Lundell & Lundell 12132, "purple" on C. L. Lundell 10955 & 11704 and Lundell & Lundell 11364, "purplish" on C. L. Lundell 11457 & 11462 and Lundell & Lundell 10369 & 11450, "pink-purple" on C. L. Lundell 10975, and "mauve-purple" on G. H. M. Lawrence 459, while on H. E. Moore 951 they are said to have been "bluer than in V. canadensis".

Kral (1973) cites Kral 31082 from Greene County, Kral 31215 from Marengo County, Kral 30953 from Montgomery County, and Kral 23786 & 39643 from Sumter County, Alabama, noting that the species is "Very abundant and showy in late spring and into the summer on the black earths and outcrops of the chalk prairies in Alabama; probably in every black belt county. However, not reported by Small from east of Louisiana. A common verbena of the prairie provinces of the west and midwest, already reported for Alabama by Harper.....and.....Perry."

The F. R. Fosberg 44661 and L. C. Higgins 3951, distributed as V. bipinnatifida, are actually V. ciliata var. longidentata Perry, Gould & Haskell 3253a is V. elegans H.B.K., Plowman & Kilham AP.18 is V. gooddingii Briq., Nafday 112 is V. tenuisecta Briq., and I. Collins s.n. [July 29, 1941] is in part V. tenuisecta Briq. and in part V. tenuisecta var. alba Moldenke.

Additional citations: SOUTH DAKOTA: Fall River Co.: G. N. Jones 35990 (Bl--191471). KANSAS: Smith Co.: Horr E.108 (Bl--35877). ARKANSAS: Franklin Co.: O. E. White s.n. [27 May 1947] (W--2646208). OKLAHOMA: Beckham Co.: Dress 2876 (Ba). Comanche Co.: Hopkins, Nelson, & Nelson 801 (Ba). Murray Co.: M. Hopkins 3959 (Ba). TEXAS: Bandera Co.: Ramirez & Cardenas 40 (Bl--209469). Bexar Co.: J. O. Perez 25 (Bl--209672). Dallas Co.: C. L. Lundell 11704 (Mi); Lundell & Lundell 11315 (Ba, Bl--71834), 12132 (Mi);

J. Reverchon s.n. [Curtiss 1962*] (Mi). Deaf Smith Co.: C. L. Lundell 11457 (Mi). Fannin Co.: McCart 2032 (Bl--103874). Gillespie Co.: Fryzell 1238 (N). Kinney Co.: Strother 263 (Bl--198050). Oldham Co.: C. L. Lundell 11462 (Mi); Lundell & Lundell 11450 (Mi). Reagan Co.: Cory 53507 (Bl--90474). Smith Co.: H. E. Moore 951 (Ba). Sutton Co.: Rohrbaugh 390 (Bl--174980). Tarrant Co.: A. Ruth 107 (Ba). Taylor Co.: Lundell & Lundell 11364 (Mi). Uvalde Co.: C. L. Lundell 10955 (Mi), 10975 (Mi). Williamson Co.: Lundell & Lundell 10369 (Mi). CULTIVATED: Canada: G. H. M. Lawrence 459 (Ba).

VERBENA BIPINNATIFIDA var. LATILOBATA Perry

Additional bibliography: Fedde & Schust. in Just, Bot. Jahresber. 60 (2): 575. 1941; Kearney, List Citations Place Publ. Spp. Ariz. Fl. 112 [typescr.]. 1951; Moldenke, Phytologia 23: 216 & 302. 1972.

xVERBENA BLANCHARDI Moldenke

Additional bibliography: Rydb., Fl. Prairies & Plains, pr. 1, 677. 1932; Fell, Fl. Winnebago Co. 122. 1955; Rydb., Fl. Prairies & Plains, pr. 2, 677. 1971; Moldenke, Phytologia 23: 216. 1972.

VERBENA BONARIENSIS L.

Additional & emended synonymy: Verbena bonariense L. ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947; Martin & Noel, Fl. Albany & Bathurst 92. 1960. Verbena bonarriensis L. ex Dhillon & Bajwa, Bull. Bot. Surv. India 11: 241, sphalm. 1969. Verbena bonaviensis Farnsworth, Pharmacog. Titles 7 (10): xvi, sphalm. 1972.

Additional & emended bibliography: Rausch., Nom. Bot., ed. 3, 3. 1797; Desf., Tabl. Écol. Bot., ed. 1, 55. 1804; Willd., Enum. Pl. Hort. Berol. 2: 633. 1809; Desf., Tabl. Écol. Bot., ed. 2, 66. 1815; Paxt., Pock. Bot. Dict., ed. 1, 328 (1840) and ed. 2, 328. 1849; Gibert, Enum. Pl. Montevid. 43. 1873; Kuntze, Rev. Gen. Pl. 3 (1): 255. 1893; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 286--287. 1900; Stearn, Fl. Batava 27: pl. 2093. 1925; Anon., Kew Bull. Misc. Inf. 1929, App. 3: 108. 1929; Wangerin in Just, Bot. Jahresber. 54 (1): 1170 [366] (1932) and 55 (1): 835. 1935; Jex-Blake, Gard. East Afr., ed. 2, 332. 1939; Oertel, U. S. Dept. Agr. Circ. 554: 21. 1939; Wangerin & Krause in Just, Bot. Jahresber. 60 (1): 704, 754 [372], & 823. 1941; Rambo, An. Bot. Herb. Barb. Rodr. 1: 125. 1949; R. C. Foster, Contrib. Gray Herb. 184: 170. 1958; P. Fournier, Quat. Fl. France 806. 1961; Watt & Breyer-Brandwijk, Med. & Poison. Pl. S. & East. Afr., ed. 2, 1054 & 1453. 1962; N. P. Singh, Bull. Bot. Surv. India 11: 357. 1969; Angely, Fl. Anal. & Fitogeogr. S. Paulo, ed. 1, 4: 838 & xix, map 1391. 1971; V. Singh, Journ. Bomb. Nat. Hist. Soc. 68: 343. 1971; Amaral Franco in Tutin & al., Fl. Eur. 3: 123. 1972; Beadle, Evans, Carolin, & Tindale, Fl. Sydney Red., ed. 2, 507. 1972; D. S. & H. B. Correll, Aquat. & Wetland Pl. SW. U. S. 1396 & 1397. 1972; De Fillips, Webbia 27: 360. 1972; Encke & Buchheim in Zander, Hand-

wörterb. Pflanzennam., ed. 10, 520. 1972; Farnsworth, Pharmacog. Titles 7 (10): xvi. 1972; Fong & al., Lloydia 25: 117-149. 1972; Kunkel, Monog. Biol. Canar. 3: 62. 1972; F. Perry, Fls. World 303 & 320. 1972; R. R. Stewart in Nasir & Ali, Fl. West Pakist. 608. 1972; Tutin in Tutin & al., Fl. Eur. 3: 369. 1972; Venter, Journ. S. Afr. Bot. 38: 231. 1972; Moldenke, Phytologia 24: 216--217 (1972) and 25: 232, 233, & 244. 1973.

Emended illustrations: Stearn, Fl. Batava 27: pl. 2093. 1925.

Recent collectors have encountered this plant in grasslands, in "brejo", at the foot of small hills, and (in New Zealand) in "poor dry yellow soil on southerly-sloping hillsides", and as a weed in cotton fields, at 125 m. altitude, flowering from December to February and fruiting in December and January. Martin & Noel (1960) assert that it blooms regularly in Australia in January and February. It has been described as an erect herb to 2 m. tall. The corollas are described as "lilac" on Hatschbach 28483 and Philson, Doore, & Nash 234, "violet" on Hatschbach, Smith, & Klein 28206, "pale-purple" on Darbyshire 534, "light-purple" on Lindeman & Haas 3935, "mauve" on Bayliss BS.2236, and "blue" on MacDaniels 2044. Martin & Noel (1960) describe the flowers as "purple". Paxton (1840) asserts categorically that the plant is "worthless" in cultivation (yet it has been or is in cultivation in at least 16 countries!). In Africa and Australia it is known as "blue-top" or "purple-top". A French vernacular name for it is "verveine de Buénos-Ayres". Oertel (1939) calls it "blue vervain" and lists it among the "honey and pollen plants" of Louisiana.

Venter (1972) refers to V. bonariensis as a "Woody herb on flood sands" in South Africa, flowering there from September to November. Dhillon & Bajwa (1969) describe it as a "weed in gardens" in Rajasthan, citing Dhillon 301; Singh (1969) refers to it as "Frequent, along the sides of the sugarcane and paddy fields" in India, flowering there from April to October and fruiting from July to October, citing his nos. 19636 & 25497. The Corrells (1972) give its habitat and distribution in the southwestern United States as "Sandy loam, ditch banks, wet or moist flatlands and along rice field fences, in Okla. (McCurtain Co.) and in e. Tex. from Red River to Jefferson cos.", blooming there from April to June. Santa Cruz reports that in Chile it occurs in "Toda la República de 36° a 41° Lat. Sur".

Baker (1900) tells us that V. bonariensis is "a native of Extratropical South America, is now established at the Cape and in Mauritius, Bombay, Madagascar, and the Canary Islands, but we have no specimens from Tropical Africa". Stewart (1972) asserts that it is "A weed from Brazil which seems to be spreading in Hazara [Pakistan]. It has been found in Abb., Mansera and Thandiani." Waterfall (1949) cites Waterfall 7599 from McCurtain County, Oklahoma -- "an adventive in.....roadside ditch -- either recently spread into the state or previously overlooked... It has been known previously from near-by Texas, Arkansas and Louisiana."

Watt & Breyer-Brandwijk (1962) report that it "has been sus-

pected in Australia of causing abortion in the bovine...No ill effects, however, have resulted from the experimental feeding of 300 gm. of dry flowering plant on each of four consecutive days."

Fournier (1961) most amazingly reduces *V. bonariensis* to synonymy under what he calls *V. chamaedryfolia* [now known as *V. peruviana* (L.) Britton], a species belonging to a completely different section of the genus! Perry (1972) reduces it to synonymy under "*V. patagonica*" [now known as *Junellia patagonica* (Speg.) Moldenke] -- the plant here referred to doubtless being *V. bonariensis* Rendle rather than the true *V. bonariensis* of Linnaeus, although no authorities are cited by her.

The *Bracelin* 1517 & 2827, *Gallinal*, *Aragone*, *Bergalli*, *Campal*, & *Rosengurtt* PE.5461, *Rosengurtt Gallinal* 5804, and *Stearn* s.n. [H. N. Moldenke 9160], distributed as *V. bonariensis*, are all actually *V. bonariensis* var. *conglomerata* Briq., *Repton* 716 is *V. brasiliensis* Vell., *Archer* 4831, *Cowgill* 903, *Dress* 1393, and *Herb. Pl. Ind.* 121505 are *xV. intercedens* Briq., *Balakrishnan* NBK.413 is *V. rigida* Spreng., *Bayliss* BS.5318 is *V. tenuisecta* Briq., and *C. N. Forbes* 546H is *Stachytarpheta dichotoma* (Rufiz & Pav.) Vahl.

Additional citations: SOUTH CAROLINA: Colleton Co.: *Bell* 2347 (Bl--150279). GEORGIA: Burke Co.: *Shacklette* 6893 (Bl--202028). FLORIDA: Bay Co.: *Moldenke & Moldenke* 26693 (Ac). ALABAMA: Pike Co.: *Moldenke & Moldenke* 26869 (Ld). MISSISSIPPI: Perry Co.: *Moldenke & Moldenke* 26836 (Ba). ARKANSAS: Drew Co.: *Demaree* 23251 (Ba). TEXAS: Orange Co.: *Cory* 48132 (Bl--253595). CALIFORNIA: Marin Co.: *Howell* 19323 (Ba, Bl--53365), s.n. [Sept. 5, 1943] (Bl--103493). BRAZIL: Paraná: *Hatschbach* 28483 (Ld); *Hatschbach*, *Smith*, & *Klein* 28206 (Ac). Rio Grande do Sul: *Lindeman & Haas* 3935 (N). CHILE: Malleco: *Santa Cruz* 1938 (Ba). ARGENTINA: Buenos Aires: *A. T. Hunziker* 4062 (Ba). Formosa: *I. Morel* 159 (Bl--104281), 1221 (Bl--104257). Misiones: *Bertoni* 2436 (Bl--104280). Santa Fé: *Querín* 657 (Ld). EGYPT: *Maire* 142 (Gz). SOUTH AFRICA: Cape Province: *Bayliss* BS.2236 (Ba, Ba). INDIA: Khasi States: *Hooker & Thomson* s.n. [alt. 1-3000 ped.] (Pd). SRI LANKA: *Amaratunga* 695 (Pd); *Balakrishnan* NBK.1038 (Pd). NEW CALEDONIA: *MacDaniels* 2044 (Ba). AUSTRALIA: Capital Territory: *Darbyshire* 534 (Ba). Queensland: *K. Russell* s.n. [7 Nov. 1943] (W--2716963). NEW ZEALAND: North Island: *Philson, Doore, & Nash* 234 (Ws). CULTIVATED: Sri Lanka: *Collector undetermined* s.n. [Hakgala, Sept. 22, 1897] (Pd); *Silva* s.n. [Hakgala, May 22, 1911] (Pd).

VERBENA BONARIENSIS var. CONGLOMERATA Briq.

Additional & emended bibliography: *Angely*, Fl. Anal. & Fito-geogr. S. Paulo, ed. 1, 4: 838 & xix. 1971; *Moldenke*, Phytologia 23: 259. 1972.

Bracelin describes the flower-color on Bracelin 1512 as "RHS [Royal Horticultural Society] 35/2 Amethyst Violet; tube 29/1 Rhodamine Purple" and found the plant in flower in July and in fruit in December. Through some palpable error in transcription, the label with Bracelin 2827 is inscribed "Tree: up to 6 feet high".

Additional citations: URUGUAY: Gallinal, Aragone, Bergalli, Campal, & Rosengurtt PE.5461 (Ba); Rosengurtt Gallinal 5804 (Ba). CULTIVATED: California: Bracelin 1512 (Ba), 2827 (Ba). Egypt: Din s.n. [29/4/1970] (Gz, Gz, Gz). England: Stearn s.n. [H. N. Moldenke 9160] (Ba, N).

VERBENA BRACTEATA Lag. & Rodr.

Additional synonymy: Verbena bractiosa Lag. & Rodr. ex C. C. Black in Cragg [ed.], Advances Ecol. Res. 7: 108, sphalm. 1971.

Additional & emended bibliography: Desf., Tabl. Écol. Bot., ed. 1, 55. 1804; Willd., Enum. Pl. Hort. Berol. 2: 634. 1809; Desf., Tabl. Écol. Bot., ed. 2, 66. 1815; Paxt., Pock. Bot. Dict., ed. 1, 328 (1840) and ed. 2, 328. 1849; Stearn, Fl. Batava 27: pl. 2082. 1925; Blewitt, Fl. Waterbury 105. 1926; Wangerin in Just, Bot. Jahresber. 54 (1): 1170 [366]. 1932; Clute, Am. Botanist 33: 113--114. 1927; Rydb., Fl. Prairies & Plains, pr. 1, 677, 678, & 967. 1932; Higgins, Occas. Pap. San Diego Soc. Nat. Hist. 8: 121. 1949; W. A. Weber, Handb. Pl. Colo. Front Range, ed. 1, 156. 1953; Evers, Ill. Nat. Hist. Surv. Bull. 26: 421 & 436. 1955; Fell, Fl. Winnebago Co. 122. 1955; W. A. Weber, Handb. Pl. Colo. Front Range, ed. 2, 156. 1961; W. A. Weber, Rocky Mtn. Fl., ed. 1, 306. 1967; Delorit, Illustr. Tax. Man. Weed Seeds 96 & 97. 1970; C. C. Black in Cragg [ed.], Advances Ecol. Res. 7: 108. 1971; Eilers, Univ. Iowa Stud. Nat. Hist. 21: 60 & 123. 1971; Ellis, Wofford, & Chester, Castanea 36: 242. 1971; Rydb., Fl. Prairies & Plains, pr. 2, 2: 677, 678, & 967. 1971; D. S. & H. B. Correll, Aquat. & Wetland Pl. SW. U. S. 1397 & 1400. 1972; Cronq., Holmg., Holmg., & Reveal, Intermount. Fl. 1: 124 & 125. 1972; Dowden, Wild Green Things 50. 1972; Wallace & Romney, Radioecol. & Ecophys. Desert Pl. vi. 1972; W. A. Weber, Rocky Mtn. Fl., ed. 2, 306. 1972; Wilkinson & Jaques, How Know Weeds, ed. 2, 123, 207, & 231, fig. 295. 1972; Moldenke, Phytologia 24: 21, 51, & 134 (1972) and 25: 226, 234, & 244. 1973; Halse, Fl. Canyon de Chelly 147 [typescr.]. 1973; Howitt & Howell, Suppl. Vasc. Pl. Monterey Co. 28. 1973.

Additional illustrations: Stearn, Fl. Batava 27: pl. 2082. 1925; Delorit, Illustr. Tax. Man. Weed Seeds 97 [in color]. 1970; Wilkinson & Jaques, How Know Weeds, ed. 2, 123, fig. 295. 1972.

Recent collectors have encountered this plant in open grassland, along railroad tracks, and on the edges of gravel roads. Smith, in New York, describes it as a gray-green plant "locally abundant in railroad yards, forming mats 3 feet across". Hitchcock & Muhlick, in Montana, assert that it forms "mats 4 feet wide on roadsides". In Idaho it was found by Baker along road-

sides in sagebrush-grass zones. Higgins (1949) cites Higgins 6788. Desfontaines (1804) records the French common name "verveine à longues bractées". The corollas are described as "bluish" on Lundell & Lundell 16973, "lavender-blue" on Dress 4089 and Florman & Kilham AP.91, "pale lavender-blue" on Dress 4887, "pale-lilac" on Dress 4886, and "pink" on S. J. Smith 2704.

Wilkinson & Jaques (1972) assert that the species is "widely distributed in waste land. Often takes over part of a barnyard", flowering from May to September. Bennett found it in moist open ground in the Transition Zone of New Mexico. The Corrells (1972) describe its habitat and distribution in the southwestern United States as "Low and newly cleared land, in mud about lakes, ponds and along sloughs, river bottoms, grassy places, waste ground and roadsides, in Tex. from the Trans-Pecos and Plains Country through the Edwards Plateau e. to Newton Co., Okla. (Waterfall), N. M. (widespread) and Ariz. (throughout state), Apr.—Oct.; almost throughout the w. U. S. and s. Can., introd. and local eastw." Ellis, Wofford, & Chester (1971) record it from Trigg County, Kentucky, while Eilers (1971) says that it is infrequent along low sandy roadsides in Benton, Blackhawk, Delaware, Floyd, Linn, and Tama Counties, Iowa. Evers (1955) avers that, although "abundant along roadsides", this plant was seen only once on a hill prairie in Illinois. Paxton (1840) asserts that it was introduced into cultivation in England in 1820.

Black (1971) reports that this is a plant with only low photosynthetic capacity: 702 grams of water are required to produce one gram of dry matter.

Delorit (1970) describes the seeds as follows: "Oblong in outline; about the same width throughout except usually slightly wider at the base. Dorsal side convex, its margins winged downward; ventral side granular, two-faced forming a longitudinal ridge where they join. Both ends of the seed usually bluntly rounded. Dorsal side usually with five longitudinal ribs, and occasionally four, which are joined by transverse ribs in the upper one-half of the seed forming a prominent network of veins. Interrib spaces large, shallow, usually flared or wider at the base. Seed scar oval, oblique, white. Golden-brown to reddish-brown, 2.0—2.4 mm long, 0.7—0.9 mm wide."

In speaking of his V. rudis, regarded as a synonym of V. bracteata by most authorities, Greene (1900) says "Its remarkable thick woody perennial roots alone would completely separate it from V. bracteosa." He describes it as a common weed "of roadsides and cultivated lands."

Material of V. bracteata has been misidentified and distributed in some herbaria as Veronica serpyllifolia var. neomexicana Cockerell.

Additional citations: NEW YORK: Chemung Co.: S. J. Smith 2704 (Ba). MARYLAND: Baltimore City: Sollers s.n. [1890] (W--2761251). ALABAMA: County undetermined: Rugel s.n. [Sept. 1843] (Bl--97103). OHIO: Hamilton Co.: E. L. Braun s.n. [VI-12-06] (W--2712373). IOWA:

Story Co.: F. C. Stewart s.n. [July 30, 1892] (Ba). KENTUCKY: Mc Creary Co.: E. L. Braun 4246 (W--2667626). SOUTH DAKOTA: Fall River Co.: G. N. Jones 35991 (Bl--191280). Jackson Co.: G. N. Jones 35171 (Bl--185496). KANSAS: Douglas Co.: Horr E.570 (Bl--88329). MONTANA: Park Co.: Hitchcock & Muhlick 13567 (Ba). Powell Co.: Hitchcock & Muhlick 11520 (Ba). Sweetgrass Co.: Hitchcock & Muhlick 13305 (Ba). IDAHO: Blaine Co.: W. H. Baker 11074 (N). Canyon Co.: W. H. Baker 8167 (N), 12930 (N). Idaho Co.: W. H. Baker 10016 (N). Nez Perce Co.: W. H. Baker 5895 (N), 5918 (N), 11343 (N), 11589 (N). Owyhee Co.: W. H. Baker 8182 (N). UTAH: Beaver Co.: Dress 4886 (Ba). Tooele Co.: Dress 4089 (Ba). NEVADA: Clark Co.: Clokey 8473 (Bl--58049). COLORADO: Alamosa Co.: Bean 51-61 (Bl--3661). Archuleta Co.: Weber & Livingston 6259 (Bl--71227). Baca Co.: W. A. Weber 5189 (Bl--56277). Boulder Co.: Ewan 1090 (Bl--76109); Moldenke & Moldenke 27479 (Ld). Denver Co.: Porter s.n. [Denver, July 13-15, 1872] (Bl--101510). Fremont Co.: Gillett & Mosquin 12125 (Bl--211363). La Plata Co.: J. Green 11 (Bl--64227). Larimer Co.: Crandall 172 (Ba). Moffat Co.: MacLeod 71a (Bl--196630). Montezuma Co.: Erdman 228 (Bl--201073). Park Co.: J. M. Coulter s.n. [Latte River, June 26] (Bl--100895). Sedgwick Co.: W. A. Weber 6407 (Bl--71229). Weld Co.: Moir 696734 (Bl--256395). OKLAHOMA: Cimarron Co.: Waterfall 10756 (Bl--85539). TEXAS: Dawson Co.: Lundell & Lundell 16973 (Ld). Tarrant Co.: A. Ruth 109 (Ba). Wood Co.: C. L. Lundell 12081 (Mi). NEW MEXICO: Dona Ana Co.: Wooton & Standley 3330 (Bl--90196). Roosevelt Co.: W. A. Weber 11399 (Bl--172251). Sandoval Co.: Flowman & Kilham AP.91 (Oa). Taos Co.: H. R. Bennett 8061 (W--2446297). ARIZONA: Apache Co.: Cutler, Goodman, & Payson 2951 (Ba). WASHINGTON: Benton Co.: L. S. Rose 48153 (Bl--253596). Chelan Co.: Dress 4887 (Ba). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated s.n. [Snake country, N. Am.] (Pd).

VERBENA BRASILIENSIS Vell.

Additional & emended bibliography: Gibert, Enum. Pl. Montevid. 43. 1873; R. C. Foster, Contrib. Gray Herb. 184: 170. 1958; Eiten in Ferré, Simpos. Sobre Cerrado 190. 1962; Angely, Fl. Anal. & Fitogeogr. S. Paulo, ed. 1, 4: 838 & xix, map 1391. 1971; R. C. Clark, Ann. Mo. Bot. Gard. 58: 232 & 233. 1971; D. S. & H. B. Correll, Aquat. & Wetland Pl. SW. U. S. 1396 & 1397. 1972; Stalter, Castanea 37: 225 & 300. 1972; Moldenke, Phytologia 24: 217, 219, & 256 (1972) and 25: 225. 1973.

Recent collectors have found this plant growing on streambanks, sandy road edges, and in clumps in open areas in new growth of pines on sandy clay soil. The corollas are described as "lavender" on Fryxell 1769, "purple" on Repton 716, "blue-lavender" on Shinners 23803, and "violet" on Krapovickas, Cristóbal, Mroginski,

& Fernandez 22296. The Corrells (1972) describe its habitat and distribution in the southwestern United States as "Waste places, dry sandy soil, coastal prairies, in swamps and marshes about lakes and on seepy banks of ponds, in Okla. (Woodward Co.) and mainly in s.e. Tex., May--Oct., introd.; nat. to most of S. A.; naturalized from Va. to Fla. and Gulf Coast, Ore., Calif., Jam., S. Afr. and elsewhere." Clark (1971) records it from Covington, Dallas, Escambia, Greene, Hale, Lee, Lowndes, Marshall, Monroe, Perry, Pike, and Tuscaloosa Counties, Alabama. Bostick (1971) found it in Henry and Rockdale Counties, Georgia, and Stalter (1972) in Georgetown County and on Outer Otter Island in Colleton County, South Carolina. Eiten (1962) cites Eiten 1595.

Additional citations: NORTH CAROLINA: Bertie Co.: Ahles & Duke 46161 (Bl--150605). Northampton Co.: Fox, Boyce, & Moreland 2097 (Bl--88344). ALABAMA: Baldwin Co.: Moldenke & Moldenke 26766 (Ac). Escambia Co.: Dress & Read 7467 (Ba). Houston Co.: Moldenke & Moldenke 26823 (Ac). Marion Co.: Moldenke & Moldenke 26819 (Ba). Stone Co.: Moldenke & Moldenke 26783 (Ld). ARKANSAS: Ashley Co.: Demaree 55972 (Bl--249318). LOUISIANA: Bossier Par.: Shinners 23803 (Ba). Ouachita Par.: Morris 262 (Bl--244309). TEXAS: Brazos Co.: Fryxell 1769 (N). CALIFORNIA: Stanislaus Co.: Howell 30107 (Bl--230589). BRAZIL: Minas Gerais: Irwin, Harley, & Onishi 29512 (N). ARGENTINA: Buenos Aires: Krapovickas, Cristóbal, Mroginski, & Fernandez 22296 (Ld). SOUTH AFRICA: Transvaal: Repton 716 (Ba). MADAGASCAR: J. H. Shaw s.n. [10 Oct. 1962] (W--2626877).

VERBENA CABRERAE Moldenke

Additional bibliography: Moldenke, *Phytologia* 23: 182--183, 418, & 431. 1972.

Additional citations: BOLIVIA: Santa Cruz: R. F. Steinbach 321 (Ws).

VERBENA CALLIANTHA Briq.

Additional bibliography: Moldenke, *Phytologia* 23: 218 & 279 (1972) and 24: 149 & 237. 1972.

Material of this species has been misidentified and distributed in some herbaria under the designation "Glandularia aff. selloi (Spr.) Tronc."

Additional citations: ARGENTINA: Misiones: Krapovickas, Cristóbal, & Maruffak 15492 (Ws).

VERBENA CAMERONENSIS L. I. Davis

Additional bibliography: Moldenke, *Phytologia* 23: 218. 1972.

Lundell encountered this species along roadsides at 500 feet altitude and describes it as "prostrate". Recent collectors have found it in bloom in March and July. The corollas are described as "purple" on C. L. Lundell 10771 & 12256.

Additional citations: TEXAS: Cameron Co.: L. I. Davis s.n. [Southmost, March 22, 1942] (Ba). [to be continued]